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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/491,810	01/28/2000	Thomas Justin Sullivan	10981801-1	9074

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EXAMINER

MEONSKE, TONIA L

ART UNIT	PAPER NUMBER
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2183

DATE MAILED: 03/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/491,810

Applicant(s)

SULLIVAN, THOMAS JUSTIN

Examiner

Tonia L Meonske

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 December 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 December 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 30 December 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claims 1-3 are rejected under 35 U.S.C. 102(e) as being anticipated by Roussel et al., US Patent 6,230,257 B1.
3. The rejections are respectfully maintained and incorporated by reference as set forth in the last office action, paper number 2, mailed on September 27, 2002.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 4-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roussel et al., US Patent 6,230,257 B1, in view of Phillips et al, US Patent 6,038,652.
6. The rejections are respectfully maintained and incorporated by reference as set forth in the last office action, paper number 2, mailed on September 27, 2002.

Response to Arguments

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7. Applicant's arguments filed September 27, 2002 have been fully considered but they are not persuasive.

8. On pages 8-10, Applicant argues in essence:

"The system apparently disclosed in the '257 patent describes two single-precision Add-execution units and two single-precision MUL-execution units. Two single-precision Add-execution units and two single-precision MUL-execution units are not a single MAC units the office action suggests. While column 3, lines 39-41 indicates that other execution units can be used to perform a SIMD operation, the '257 patent fails to describe how a single MAC unit can be used to perform a SIMD operation. Consequently, for at least this reason, the '257 patent fails to disclose, teach, or suggest each element of the Applicant's claimed invention."

However, in an alternate embodiment, Roussel et al. have taught using a single MAC unit instead of separate add and multiply units to perform multiply-accumulate operations.

(column 3, lines 39-41) It is not necessary for Roussel et al. to have specifically taught how to replace the ADD and MUL execution units with a MAC unit. Roussel et al. has in fact taught the MAC as claimed in the present application.

9. On page 10, Applicant argues in essence:

"The apparatus of '257 patent uses passive delay elements arranged to intercept data as it is clocked to the plurality of execution units. In contrast, Applicant's claimed invention recites "a MAC unit" and a "register communicatively coupled to the MAC unit, the register configured to store the first half of the data result;..." Passive delay units arranged to intercept data bytes on their way to an execution unit do not teach a register coupled to a MAC unit configured to store a data result. Consequently, for at least this second reason, the '257 patent fails to disclose, teach, or suggest each element of the Applicant's claimed invention."

However, the delay elements of Roussel et al. store a value which is read out sometime later. (Column 4, lines 35-57, column 7, lines 11-14) Specifically, M3 stores a value and then the value is read once the high order results are ready. A register is something that

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merely holds or stores information for some period of time. Since the delay element, M3 of Roussel et al., holds the low order results, M3 is a register.

10. On pages 10-11, Applicant argues in essence:

"The apparatus of the '257 patent discloses the use of passive delay elements to delay data bytes before they are processed by multiple execution units. In further contrast, Applicant's claimed invention uses "a miscellaneous-logic unit configured to initiate the release of the first half of the data result from the register to synchronize the first half of the data result with the second half of the data result." Thus, the '257 patent fails to disclose, teach, or suggest each element of the Applicant's claimed invention."

However, there must be some logic, or miscellaneous logic, that indicates the release of the value stored in M3 during a certain clock cycle in order to synchronize the data results. In Roussel et al. there is a clock signal that controls M3 and inherently logic looking for the clock signal, so there is miscellaneous logic initiating the release of the data result. Delaying the data result in M3 is for synchronizing the result. Therefore the miscellaneous logic of Roussel et al. is performing the same function as the miscellaneous logic claimed by Applicant.

11. On pages 11-12, Applicant argues in essence:

"As pointed above, the '257 patent fails to teach each element of Applicant's independent claim 1. Thus modifying the apparatus of the '257 patent to add exception handling as the office action suggest fails to remedy the failure of the '257 patent to disclose, teach, or suggest Applicant's claimed apparatus."

However, as proven above, patent '257 has taught each element of Applicant's claimed invention, therefore this argument is moot.

12. On pages 12-15 Applicant argues in essence:

"The apparatus apparently disclosed in the '652 patent shows a plurality of exception detectors in a one-to-one relationship with a plurality of processing elements. When exceptions are indicated by the exception detectors, an exception signal is forwarded to a combining unit that generates a global exception from one or more exception signals."

Significantly, the '652 patent does not describe what to do with the global exception after it is generated...Neither the '257 patent nor the '652 patent disclose, teach, or suggest "means for forwarding the first data result and the second data result to a buffer when the exception result indicates that the first data result and the second data result are valid; and means for communicating the exception to the buffer when the means for forwarding indicates that the first and second data results are invalid.""

However, if there are no exceptions to report then both results are valid and they are written to the register file. (Roussel et al., Figures 4A and 5) Alternatively, if there were exceptions, then there would be no result and the exception would need to be reported, as taught by Phillips et al. (Phillips et al, Figure 3, element 380) Therefore, Phillips et al. has in fact taught what to do with the exception after its generated i.e. report the exception. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the invention of Phillips et al. with the invention of Roussel et al. to arrive at the claimed invention. As indicated in the previous office action, Phillips et al. have taught that overflow or other exceptions may occur during multiply and accumulate functions and that it is necessary to report the exception in an efficient manner so that appropriate action can be taken (column 1, lines 20-46, column 4, lines 29-39).

Generating an exception result and inputting said exception result into a buffer if the operand data's are invalid is an efficient way to correct the exception because the exception is immediately treated upon detection. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the method for performing SIMD instructions, as taught by Roussel et al., include: generating an exception result by said by a MISC unit; inputting said first operand data result and said second operand data result into a buffer if said MISC logic determines that said first operand data result and said second operand data result are valid; and inputting said

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exception result into said buffer if said MISC unit determines that said first operand data result and said second operand data result are invalid, so that when an exception occurs, the exception can be reported and corrected immediately in an efficient manner.

Conclusion

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

14. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tonia L Meonske whose telephone number is (703) 305-3993. The examiner can normally be reached on Monday-Friday, 7-4:30. with every other Friday off.


16. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie P Chan can be reached on (703) 305-9712. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7239 for regular communications and (703) 746-7238 for After Final communications.

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17. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

tlm

February 26, 2003



RICHARD L. ELLIS
PRIMARY EXAMINER